



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/810,112

03/26/2004

David Fifield

BP 3208

8027

34399

7590

08/02/2006

GARLICK HARRISON & MARKISON

P.O. BOX 160727

AUSTIN, TX 78716-0727

EXAMINER

SAMS, MATTHEW C

ART UNIT

PAPER NUMBER

2617

DATE MAILED: 08/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/810,112	Applicant(s) FIFIELD, DAVID	
	Examiner Matthew C. Sams	Art Unit 2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 May 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. This office action is in response to the amendment filed on 5/23/2006.
2. The Art Unit location of your application in the USPTO has changed. To aid in correlating any papers for this application, all further correspondence regarding this application should be directed to Art Unit 2617.

Response to Arguments

3. Applicant's arguments filed 5/23/2006 have been fully considered but they are not persuasive.
4. In response to the applicant's argument that Greer does not provide a teaching of a "first pair of antenna elements" for transmitting and receiving signals at a first frequency and a "second pair of antenna elements" for transmitting and receiving at a second frequency (Page 7 Para 2), the examiner disagrees.

Greer specifically states "a first pair of antennas having different signal polarization characteristics" and "a second pair of antennas having different radiation pattern characteristics". (Page 8 Claim 17) Greer teaches the frequency bands of interest are for IEEE 802.11a (5 GHz) and IEEE 802.11b/g (2.4 GHz). (Page 2 [0014]) Therefore, Greer teaches a first and second pair of antenna elements for transmitting and receiving signals at a first frequency and a second frequency.

5. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

In this case, the examiner's point of the motivation is spatial diversity and polarization diversity can either independently or together provide improved reception performance (Greer Page 2 [0017-0020]). As the applicant noted on Page 8, He teaches that spatial diversity can improve reception. (Page 2 [0025]) When combining the teachings of He in view of Greer, the implementation of He onto a PCMCIA would decrease the physical separation of the antenna elements found within He, but makes the diversity antennas more compact and portable by placing the antennas on a PCMCIA card. Greer teaches not only spatial diversity on a PCMCIA card, but an additional reception improving technique called polarization diversity. (Greer Page 2 [0017-0020] and Page 3 [0032-0036]) It would have been obvious to one of ordinary skill in the art to implement diversity antennas of He onto a PCMCIA card of Greer when incorporating the spatial diversity and polarization diversity teachings included within Greer. Therefore, the examiner has established a *prima facie* case of obviousness based on evidence found within the prior art.

6. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over He et al. (US 2004/0198420 hereafter, He) in view of Greer et al. (US 2003/0146876 hereafter, Greer).

Regarding claim 1, He teaches a communication system for providing dual band wireless communications (Fig. 1 and Page 2 [0019-0025]) comprising a first radio transceiver operable to communicate using RF signals at a first frequency, a second radio transceiver operable to communicate using RF signals at a second frequency (Page 2 [0022] and Fig. 1 [3]), and using a diversity switch (Fig. 1 [SW1 & SW2]) to

connect one of the dual-band antennas with either the first or second radio transceiver. (Fig. 1 and Page 2 [0019-0025]) He teaches implementing the circuit in a laptop computer (Page 2 [0025]) using various interfaces (Page 2 [0019]), but differs from the claimed invention by not explicitly reciting a first and second "pair" of antennas, each "pair" operating at differing frequencies and implemented on a PCMCIA.

In an analogous art, Greer teaches a multiple antenna diversity for wireless local area network (WLAN) applications that includes a first pair of antenna elements, a second pair of antenna elements, a diversity switch for connecting the transceivers with the appropriate antenna pair (Page 8 Claim 17) where the antenna elements are disposed on a PCMCIA card (Page 4 [0044]) to optimize reception and transmission for the operating frequencies being implemented on a PCMCIA card. (Page 3 [0036], Page 8 Claims 18 and 19) At the time the invention was made, it would have been obvious to one of ordinary skill in the art to implement the invention of He on a PCMCIA after modifying it to incorporate the antenna diversity and selection of Greer. One of ordinary skill in the art would have been motivated to do this since spatial diversity and polarization diversity can improve reception performance (Greer Page 2 [0017-0020]) and would become necessary with implementation on a PCMCIA card since the antennas of He would no longer be located in different locations of the laptop as hoped for in Page 2 [0025] of He.

Regarding claim 2, He in view of Greer teaches the antenna element pairs are on the same end of the PCB but on opposite sides of the PCB. (Greer Fig. 1, Fig. 8, Fig. 9, Fig. 17, Page 2 [0019], and Pages 3-4 [0037])

Regarding claim 3, He in view of Greer teaches the circuit board comprises a ground plane disposed between the individual antenna elements on opposite sides of the circuit board. (Greer Page 4 [0044] and Page 5 [0051])

Regarding claim 4, He in view of Greer teaches the first and second elements of the first pair of antenna elements are oriented to maximize polarization diversity to optimize transmission and receptions of the RF signals. (Greer Pages 2-3 [0021])

Regarding claim 5, He in view of Greer teaches the first and second antenna elements are disposed on the circuit board with an orientation to be orthogonal with respect to each other. (Greer Page 2 [0020] and Page 6 [0059])

Regarding claim 6, He in view of Greer teaches the first and second pair of antenna elements are oriented to maximize polarization diversity to optimize transmission and reception of the RF signals. (Greer Page 2 [0020], Page 4 [0042] and Page 6 [0059])

Regarding claim 7, He in view of Greer teaches the first and second antenna elements of the second pair of antenna elements are disposed on the circuit board with an orientation that is orthogonal to each other. (Greer Page 8 Claim 14 and Claim 17)

Regarding claim 8, He in view of Greer teaches the first pair of antenna elements can operate at 2.4 GHz. (He Fig. 1 and Greer Page 2 [0014-0015])

Regarding claim 9, He in view of Greer teaches the second pair of antenna elements can operate at 5 GHz. (He Fig. 1 and Greer Page 2 [0014-0015])

Regarding claim 10, He in view of Greer teaches the circuit board contains the first and second transceiver, the diversity switch, the first and second pair of antennas,

all of which are implemented in a PCMCIA module. (He Page 2 [0019] and Greer Page 3 [0036] and Page 4 [0044-0046])

Regarding claim 11, the limitations of claim 11 are rejected as being the same reason stated above in claim 1.

Regarding claim 12, the limitations of claim 12 are rejected as being the same reason stated above in claim 2.

Regarding claim 13, the limitations of claim 13 are rejected as being the same reason stated above in claim 3.

Regarding claim 14, the limitations of claim 14 are rejected as being the same reason stated above in claim 4.

Regarding claim 15, the limitations of claim 15 are rejected as being the same reason stated above in claim 5.

Regarding claim 16, the limitations of claim 16 are rejected as being the same reason stated above in claim 6.

Regarding claim 17, the limitations of claim 17 are rejected as being the same reason stated above in claim 7.

Regarding claim 18, the limitations of claim 18 are rejected as being the same reason stated above in claim 8.

Regarding claim 19, the limitations of claim 19 are rejected as being the same reason stated above in claim 9.

Regarding claim 20, the limitations of claim 20 are rejected as being the same reason stated above in claim 10.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew C. Sams whose telephone number is (571)272-8099. The examiner can normally be reached on M-F 7:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lester Kincaid can be reached on (571)272-7922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2617

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MCS
7/27/2006



LESTER G. KINCAID
SUPERVISORY PRIMARY EXAMINER